REMARKS

Applicant respectfully requests reconsideration of this application as amended. Claims 1-3, 5, 6, 9-12, and 15-17 are currently pending in this application.

Specification

The disclosure has been objected to because of an informality in the Drawings.

Claim Rejections - 35 U.S.C. §102(e)

Claims 1-3, 5, 6, 9-12, and 15 have been rejected under 35 U.S.C. §102(e) as being anticipated by Kub et al. (U.S. Patent Publication No. 2004/0224482).

Claim Rejections - 35 U.S.C. §103(a)

Claims 1-3, 5, 6, and 9-12 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kub et al. (U.S. Patent No. 6,323,108) in view of Ghyselen et al. (U.S. Patent No. 6,867,067).

Claims 15 and 16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kub et al. (U.S. Patent No. 6,323,108) in view of Letertre et al. (U.S. Patent No. 6,815,309).

Claim 17 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Kub et al. (U.S. Patent No. 6,323,108) and Letertre et al. (U.S. Patent No. 6,815,309) as applied to claim 15 above, and further in view of Lam et al. (U.S. Patent Publication No. 2005/0060115).

Response to Informality in the Specification

Applicant submits new figures 4d, 4e and 4g, enclosed.

Response to 35 U.S.C. §102(e) rejections

With regard to the rejection of claims 1-3, 5, 6, 9-12, and 15 under 35 U.S.C. §102(e) as being anticipated by Kub et al. (U.S. Patent Publication No. 2004/0224482), applicant submits that Kub et al. does not discloses an element of the present application,

namely "*depositing a bulk heat dissipating handle substrate onto the semiconductor donor substrate*".

Applicant submits that the present invention discloses a step of depositing a handle substrate, defined as to provide the ability *"to withstand handling during processing"* (Paragraph [0026], line 3 from bottom). An exemplary method according to the present invention deposits a handle substrate having a thickness *"between 750 μm and 800 μm"* to allow processing of a thin semiconductor donor layer (Paragraph [0025], line 7 from bottom).

In contrast, Kub et al. discloses a step of bonding a handle substrate to the semiconductor substrate 11, with the handle substrate being a flexible substrate 16 and the semiconductor substrate 11 may comprise an optional stiffening layer:

"bonding the surface of the single crystal semiconductor substrate or surface of the stiffening layer to a flexible substrate" (Paragraph [0017], lines 8-10).

Thus applicant submits that Kub et al. is silent with respect to the teaching of depositing a handle substrate onto the semiconductor donor substrate.

Further, applicant submits that Kub et al.'s teaching of depositing a stiffening layer on the semiconductor substrate does not provide the necessary element of depositing a handle substrate. Firstly, the stiffening layer is an optional layer, thus does not provide the handling capability of a handle substrate. Secondly, though disclosing that the deposited layer is a stiffening material layer, Kub et al. employs materials with various hardness, ranging from hard material of diamond, to a very soft material of polyimide or polymer (Paragraph [0045]). Thus applicant submits that Kub et al.'s teaching of depositing a stiffening layer on the semiconductor substrate does not constitute depositing a handle substrate capable of withstand handling during processing, despite the use of the word "stiffening".

In sum, applicant submits that Kub et al. does not disclose an element of the present invention, namely "depositing a bulk heat dissipation handle substrate onto the semiconductor donor substrate", and therefore the present invention cannot be anticipated from Kub et al.

Response to 35 U.S.C. §103(a) rejections

Ghyselen et al.claims 1-3, 5, 6, and 9-12 under 35 U.S.C. §103(a) as being unpatentable over Kub et al. (U.S. Patent No. 6,323,108) in view of Ghyselen et al. (U.S. Patent No. 6,867,067), applicant submits that there is no motivation to combine these two references.

Applicant submits that Kub et al. discloses a bonding process to bond a handling substrate 18 to a semiconductor substrate 10, before the splitting of the semiconductor substrate.

Applicant submits that Ghyselen et al. discloses a SiC deposition process, but since the SiC deposition of Ghyselen et al. occurs after the splitting of the semiconductor substrate, applicant submits that Ghyselen et al. does not disclose the deposition of a handle substrate, and thus there is no motivation to combine the deposition process of Ghyselen et al. with that of Kub et al.

Since the semiconductor substrate after splitting is typically very thin, the present invention discloses the deposition of a handle substrate, which can support the semiconductor substrate during and after the splitting. Thus the handle substrate is to be deposited before the splitting of the semiconductor substrate. This is a novel concept with respect to Kub et al. who discloses a bonding process to support the thin semiconductor substrate.

Ghyselen et al. also employs a bonding process to support the semiconductor substrate during and after splitting, similar to Kub et al.'s process. In fact, the process of Ghyselen et al. completely encompasses the process of Kub et al., namely the first three steps of Ghyselen et al. are identical to the only three steps of Kub et al. The deposition of the SiC layer according to Ghyselen et al. occurs only after the completion of the splitting of the semiconductor substrate, with the thin donor layer supported by a bonding process of sacrificial layers 10 and 11. The deposited SiC layer according to Ghyselen et al. only serves to support the semiconductor substrate for the elimination of the sacrificial bonding layers 10 and 11, not for the splitting of the donor substrate. Thus applicant submits that there is no motivation to combine the deposition of Ghyselen et al. to the semiconductor splitting technique of Kub et al. Further, since Ghyselen et al. employs

completely the process of Kub et al., applicant submits that there is nothing to combine since the complete process of Kub et al. is already a part of the process of Ghyselen et al.

Further, applicant submits that the present invention is novel with respect to Ghyselen et al. To achieve the final substrate 14, Ghyselen et al. employs sacrificial bonding layers 10 and 11, preparing these layers, bonding them in step 100, and eliminate the bonding between these layers in step 400. (See Fig. 1 of Ghyselen et al.).

In contrast, the present invention does not employ any sacrificial bonding layers, where the handle substrate 432 is deposited on the semiconductor substrate 412. (See Fig. 4c of the present application). Applicant submits that the present invention is simpler and possesses novelty over Ghyselen et al.

With respect to the rejection of claims 15 and 16 under 35 U.S.C. §103(a) as being unpatentable over Kub et al. (U.S. Patent No. 6,323,108) in view of Letertre et al. (U.S. Patent No. 6,815,309), applicant submits that both Kub et al. and Letertre et al. do not discloses a deposition process of SiC on a semiconductor substrate.

Kub et al. discloses a bonding process between a semiconductor substrate and a handle substrate, as discussed above.

Applicant submits that Letertre et al. also discloses a bonding process between a high quality single crystal SiC donor substrate with a CVD low quality polycrystalline SiC support substrate.

> *Advantageously, the fabrication of the donor slice/mechanical support assembly in this example may for example involve: ...*
> *positioning the polished face in intimate contact with a face of a suitably planar polycrystalline SiC support wafer to bond them together by wafer bonding; and*
> *producing the support wafer having a thickness for example of around 200 to 300 μm (before bonding with the donor layer) typically by thick-film deposition of the CVD type.* (Col. 6, line 57 to Col. 7, line 7).

Applicant submits that Letertre et al. produces a support wafer by e.g. a CVD process, and then bonds the support wafer and the donor wafer together by a wafer bonding process. Letertre et al. further suggests strengthening the bonding process of the donor wafer and the support wafer with addition processing steps such as a thermal anneal process (Col. 7, lines 8-11).

Thus applicant submits that Letertre et al. does not disclose a deposition process of SiC layer onto a donor semiconductor substrate. Letertre et al. discloses a production of a separate CVD SiC layer, and then bonding this layer to a donor substrate.

In sum, applicant submits that the combination of Kub et al. and Letertre et al would not render the present invention obvious since both references do not teach the deposition of a SiC handle layer onto a semiconductor substrate.

With respect to the rejection of claim 17 under 35 U.S.C. §103(a) as being unpatentable over Kub et al. (U.S. Patent No. 6,323,108) and Letertre et al. (U.S. Patent No. 6,815,309) as applied to claim 15 above, and further in view of Lam et al. (U.S. Patent Publication No. 2005/0060115), applicant submits that claim 17 is a dependent claim, thus should be allowable, at least for the reason stated above with respect to the independent claim 15.

In conclusion, applicants respectfully submit that in view of the amendments and arguments set forth herein, the applicable rejections have been overcome.

Please charge any shortages and credit any overcharges to our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

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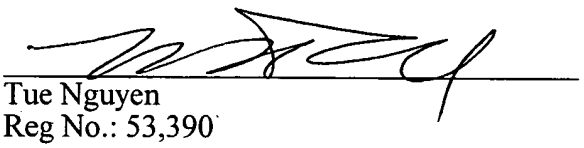

Tue Nguyen
Reg No.: 53,390

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025-1026
(408) 720-8300